

## CLAIMS

We claim:

1           1.     A system for synchronizing playback of media content with other content or with host  
2     computer time information, the system comprising:  
3               a web browser for providing a timing representation to a media player;  
4               a media player implementing a first interface for object management and a second interface for  
5     exchanging timing and synchronization information with the web browser; and  
6               a player-hosting peer within the web browser for negotiating a playback state and a rendering  
7     status between the browser and the media player.

1           2.     The system of claim 1 wherein the player-hosting peer issues commands to the media  
2     player.

1           3.     The system of claim 2 wherein the media player notifies the player-hosting peer of  
2     media player state changes.

1           4.     The system of claim 1 wherein the second interface includes a playback state and a  
2     current playback time passed from the media player to the web browser.

1           5.       The system of claim 4 wherein the player and the player-hosting peer jointly maintain  
2       the playing state and the current playback time.

1           6.       The system of claim 1 wherein the second interface includes web browser time  
2       information and/or application time information passed from the browser to the media player.

1           7.       The system as in claim 1 wherein the player-hosting peer transitions through states  
2       including inactive, active, waiting for data, and out of sync.

1           8.       The system as in claim 7 wherein the player-hosting peer transitions from the inactive  
2       state to the active state upon receiving a media cued notification from the media player.

1           9.       The system as in claim 8 wherein the player-hosting peer transitions from the active  
2       state to the inactive state upon receiving a deactivate command from the browser.

1           10.      The system as in claim 8 wherein the player-hosting peer transitions from the active  
2       state to the inactive state upon receiving a change source command from the browser.

1           11.      The system as in claim 8 wherein the player-hosting peer transitions from the active  
2       state to the waiting for data state upon receiving a buffer empty notification from the media player.

1           12.     The system as in claim 11 wherein the player-hosting peer transitions from the waiting  
2     for data state to the active state upon receiving a buffer full notification from the media player.

1           13.     The system as in claim 11 wherein the player-hosting peer transitions from the waiting  
2     for data state to the active state upon receiving a seek command from the browser.

1           14.     The system as in claim 8 wherein the player-hosting peer transitions from the active  
2     state to the out of sync state upon detecting a sync lost condition.

1           15.     The system as in claim 14 wherein the player-hosting peer transitions from the out of  
2     sync state to the active state upon detecting a sync recovered condition.

1           16.     The system as in claim 14 wherein the player-hosting peer transitions from the out of  
2     sync state to the active state upon receiving a seek command from the browser.

1           17.     The system as in claim 1 wherein the media player transitions through states including  
2     no source, playing, seeking, and media done.

1           18.     The system as in claim 17 wherein the media player transitions from the no source  
2     state to the playing state upon completion of media cueing.

1           19.   The system as in claim 18 wherein the media player transitions from the playing state  
2   to the no source state upon receiving a change source command from the player-hosting peer.

1           20.   The system as in claim 18 wherein the media player transitions from the playing state  
2   to the seeking state upon receiving a seek command from the player-hosting peer.

1           21.   The system as in claim 20 wherein the media player transitions from the seeking state  
2   to the playing state upon completion of a seek operation.

1           22.   The system as in claim 18 wherein the media player transitions from the playing state  
2   to the media done state upon receiving a stop command from the player-hosting peer.

1           23.   The system as in claim 22 wherein the media player transitions from the media done  
2   state to the playing state upon receiving a start command from the player-hosting peer.

1           24.   The system as in claim 18 wherein the media player transitions from the playing state  
2   to the media done state upon finishing media playback.

1           25.   The system as in claim 24 wherein the media player transitions from the media done  
2   state to the playing state upon receiving a start command from the player-hosting peer.

1           26.   The system as in claim 1 wherein the media player notifies the player-hosting peer  
2   when media is ready for playback.

1           27.   The system as in claim 1 wherein the media player prepares for destruction upon  
2   receiving a deactivate command from the player-hosting peer.

1           28.   The system as in claim 1 wherein the media player changes from a first media source  
2   to a second media source upon receiving a change media source command from the player-hosting  
3   peer.

1           29.   The system as in claim 1 wherein the media player notifies the player-hosting peer of a  
2   buffer empty condition when media playback can not continue due to a media delivery problem.

1           30.   The system as in claim 29 wherein the media player notifies the player-hosting peer of  
2   a buffer full condition when the media delivery problem has been resolved and media playback can  
3   continue.

1           31.   The system as in claim 1 wherein the player-hosting peer notifies the player that the  
2   media playback time is out of sync with time information maintained by the player-hosting peer.

1           32.     The system as in claim 31 wherein the player-hosting peer notifies the player that  
2     synchronization has been regained between the media playback time and time information maintained  
3     by the player-hosting peer.

1           33.     The system as in claim 1 wherein the player-hosting peer passes commands from the  
2     browser to the player, the commands including play, stop, pause, resume, and seek.

1           34.     The system as in claim 1 wherein the player-hosting peer passes a seek command from  
2     the browser to the player to indicate that the player should jump to a specific time offset into media  
3     playback.

1           35.     The system as in claim 1 wherein the web browser is operating in a television set top  
2     environment.

1           36.     The system as in claim 1 wherein the other content includes advertising or other  
2     commercial content synchronized with at least one portion of the media content.

1           37.     The system as in claim 1 further comprising a proxy layer for passing synchronization  
2     information or commands or both synchronization information and commands between the browser  
3     and an external media player.

1        38. The system as in claim 1 wherein the player-hosting peer implements an interface for  
2 providing access to timing information from the player-hosting peer.

1        39. A method of synchronizing playback of media content with other content or with host  
2 computer time information, the method comprising the steps of:  
3            providing a timing representation to a media player;  
4            implementing a first media player interface for object management and a second media player  
5 interface for exchanging timing and synchronization information with a web browser; and  
6            issuing commands from the web browser to the media player, the commands being directed to  
7 media player operations other than, and in addition to, instantiation of the media player; and  
8            notifying the web browser of media player state changes.

1        40. The method of claim 39 wherein the second media player interface includes a playback  
2 state and a current playback time passed from the media player to the web browser.

1        41. The method of claim 40 wherein the player and the web browser both maintain the  
2 playing state and the current playback time.

1        42. The method of claim 39 wherein the second media player interface includes the host  
2 computer time information passed from the browser to the media player.

1        43.    The method of claim 39 wherein the media player notifies the player-hosting peer  
2    when media is ready for playback.

1        44.    The method of claim 39 wherein the media player prepares for destruction upon  
2    receiving a deactivate command from the browser.

1        45.    The method of claim 39 wherein the media player changes from a first media source to  
2    a second media source upon receiving a change media source command from the browser.

1        46.    The method of claim 39 wherein the media player notifies the browser of a buffer  
2    empty condition when media playback can not continue due to a media delivery problem.

1        47.    The method of claim 46 wherein the media player notifies the browser of a buffer full  
2    condition when the media delivery problem has been resolved and media playback can continue.

1        48.    The method of claim 39 wherein the browser notifies the player that the media  
2    playback time is out of sync with time information maintained by the browser.

1        49.    The method of claim 44 wherein the browser notifies the player that synchronization  
2    has been regained between the media playback time and time information maintained by the browser.

1        50.    The method of claim 39 wherein the commands passed from the browser to the player  
2 include play, stop, pause, resume, and seek.

1        51.    The method of claim 39 wherein the browser passes a seek command to the player to  
2 indicate that the player should jump to a specific time offset into media playback.

1        52.    The method of claim 39 wherein the other content includes advertising or other  
2 commercial content synchronized with at least one portion of the media content.

1        53.    The method of claim 39 wherein the media player is external to the browser.

1        54.    The method of claim 39 wherein the step of providing a timing representation to a  
2 media player further comprises the step of implementing an interface to provide access to timing  
3 information from the web browser.